

Quebec (prov.). Mines, Dept.

27
Q3A3
1906
DEPARTMENT

— OF —

Colonization, Mines and Fisheries.

Physical &

Applied Sci.

Serials

Engineering

Mining industry 1906

MINING OPERATIONS

— IN THE —

Province of Quebec

FOR THE YEAR

1906

— BY —

J. OBALSKI

SUPERINTENDENT OF MINES



QUEBEC

PRINTED BY CHARLES PAGEAU

Printer to the King's Most Excellent Majesty

1907

DEPARTMENT

— OF —

Colonization, Mines and Fisheries.



MINING OPERATIONS

— IN THE —

Province of Quebec

FOR THE YEAR

1906

— BY —

J. OBALSKI

SUPERINTENDENT OF MINES




QUEBEC

PRINTED BY CHARLES PAGEAU

Printer to the King's Most Excellent Majesty

1907



Digitized by the Internet Archive
in 2011 with funding from
University of Toronto

Hon. JEAN PRÉVOST,
Minister of Colonization, Mines and Fisheries,
Quebec.

Sir,

I have the honor to submit my annual report on the mines of the province.

The progress noted in my last report continues and the activity of mining prospectors is evidenced by the large increase in the receipts of the Bureau of Mines. Production has risen from \$3,755,000 last year to \$5,500,000 in 1906. Interesting discoveries of gold-bearing quartz have been made near Lake Opasatica, north of the County of Pontiac, and everything foreshadows the making of other discoveries during next season. At Chibogomo, the existence of cobalt has been noted, thus proving similarity between that formation and the formation to the South West, where such wonderful discoveries have been made. There is reason therefore to hope that, once opened up by railways, our great Northern region, from Temiscamingue to Mistassini, will be the scene of a development equal to that in the richest sections of our province. In this work, you will find the usual notes upon the mines in operation and a special report accompanied by a map of an exploration which I have made to the North of the County of Pontiac and beyond the height of land.

I have the honor to be,

Sir,

Your obedient servant,

J. OBALSKI,
Superintendent of Mines

Quebec, April 1907.

EXPLORATION TO THE NORTH OF THE COUNTY OF PONTIAC

The important discoveries made at Cobalt, (Ontario) have had their effect upon the Province of Quebec in the region to the East of Lake Temiscamingue and the Ontario boundary line, where the same Huronian formation exists.

During the months of June and July, I explored a part of this region, pursuing the following route : Starting from Ville Marie, the canoes and provisions were conveyed by the road traversing the townships of Duhamel and Laverlochère to the Gillies farm at the head of Baie des Quinze, whence, following that bay in canoes and crossing lake Expanse, the river Ottawa was followed to its meeting with the river Kinojevis, which was ascended, as was the river Keewagama to the lake of the same name, which I crossed, in its Northern part, and also lake Newagama ; thence by the inlet of this lake to the height of land, which is traversed by a two mile portage leading to lake Askikwaj, which is crossed to the South to its inlet, which I followed to lake Kienawisik crossing the latter, as well as lake Long and lake Wiquaskopang to near the height of land. I thence returned on my track, traversing the same lakes and lake Askikwaj towards the East as far as the river Harricanaw which I descended to lake Obalski, situated at about 16 miles from the line of the Transcontinental ; I explored this line for a distance of 15 miles on each side of the river Harricanaw and which I rejoined by descending the Peter Brown creek : I next followed the same route as in going up as far as the river Kinojevis, which I reascended to cache No. 9 from which point I explored between Mulsworth and Spirit lakes. I then went down the river Kinojevis again to the West branch, which I reascended to the height of land by crossing lakes Kajakamikamac and Kakameonan. From the height of land I went down to lake Agotavekami which I crossed to the North West to the river Abittibi, and descended that river to the lake of the same name, which I crossed to the East and then ascended the river Anitikik to the line of the Transcontinental. Then returning I crossed lake Agotawekami from North to South, next following the river to lake Obadowagaking which I traversed to the height of land. On the

other side of the Portage, I followed lake Opasatica, the Lonely river, lakes Barrière and Obikoba, from which I got back to Lac des Quinze and the Gillies farm from which I had started, after covering about 600 miles.

Two other roads may be followed to reach lake Askikwaj: 1. After leaving lake Expanse, you may follow the Ottawa river to a chain of small lakes leading to the height of land and thence to lake Wiquaskopang.

2. Leaving the river Kinojevis by a portage leading to lake Long, thence to lake Wabacous and the river Keekeec to strike the southern end of lake Keewagama. These two routes are shorter in point of distance, but harder on account of the many portages. By the road which I followed you may count that it will take seven days from the Gillies farm to lake Askikwaj, with eight portages only, as follows: on the Ottawa river, Sturgeon, 420 yards; Little Sturgeon immediately after, 60 yards; on the river Kinojevis, Cyclone, 180 yards followed by a small fall on the river; Clay, 1260 yards; Cascade, 840 yards: on the river Keewagama, on approaching close to the lake, a small rapid of 60 yards, succeeded by another of 300 yards; lastly, the height of land portage, 2 miles. From lake Askikwaj, no further obstruction is met with except three small rapids, north of the Transcontinental, on the river Harricanaw, which can be descended without portaging. All the above portages are made to avoid rapids, but the latter are generally run coming down. Apart from these rapids, the rivers met with are pretty broad and deep, with little current except at some narrow points.

General Aspect of the Country

The region traversed from Baie des Quinze is generally level or undulating and is still pretty well wooded, though a good part of the merchantable timber has been cut off; it is a moreover under timber license. In the low grounds, the soil is clayey and of very good quality in the valleys of the Ottawa and Kinojevis rivers. Rocky hills, to which reference is made further on, are visible at intervals. The Height of Land is reached imperceptibly and consists of a slight elevation only over the adjacent ground. When this height of land is passed, the large lake Askikwaj is reached. It has a width of 8 miles E. W. by 7 miles N. S. and its shores and islands are rocky, the beaches being form-

ed of boulders and sand. The valleys of the rivers leading to lake Wiquaskopang also embrace a great deal of low clay grounds, with rocky hills, where there is still a little timber and on the East side of lake Long there is pine actually under timber license.

From lake Wiquaskopang to lake Askikwaj, the river is broad with a depth of over 15 feet and offers a stretch of water navigable by large steamboats, which continues moreover to the 1st rapid on the river Harricanaw, thus forming 70 miles of navigation.

Going down the river Harricanaw after leaving lake Askikwaj, but few rocky hills are encountered. These moreover belong to the Huronian formation and to the granites and syenites of that age. The land is flat and covered with a heavy layer of excellent clay soil on both sides of the river. There are some lower grounds which are flooded at high water but which could be easily drained if the obstruction occasioned by the first rapid on the river Harricanaw were removed, which would lower its level about three feet.

Below this rapid, which is easily run, there are two others of boulders, which do not necessitate portages either.

The river from lake Askikwaj to lake Obalski, a distance of about 50 miles, has several small tributaries which are navigable for a few miles by canoes and the most important of which is the Peter Brown Creek at five miles above the first rapid, which is navigable for 15 to 18 miles with a few trifling obstructions.

At about three quarters of a mile above the first rapid, the line of the Transcontinental Railway crosses the river Harricanaw at a point where the banks are clayey, the width being 400 feet and the depth 26; from this point I followed the line to the West as far as Spirit Lake which is apparently just north of the Height of Land. Along this distance of 7 miles, the land is formed of clay soil pretty well wooded for 3 or 4 miles, then there are some small swamps with stony bottoms and covered with a growth of moss and small black spruce: the shores of Spirit Lake, which appears to be about 2 miles long by 1 wide, are flat and sandy. Over all this tract no rock *in situ* is to be seen, only some large boulders generally of diorite and diabase.

I followed the line to the East of the river Harricanaw for about 15 miles, meeting in the first place flat land of good clay, suitable for cultivation and covered with medium sized timber consisting mostly of black spruce banksian pine, large poplar with a little gray and white birch ; then some small swamps with clay or stony bottom, which did not appear to extend far from the line north or south. At about 7 miles from the river and to the north of the line, there is a pretty considerable rocky outcrop of 120 feet in height, showing serpentine which will be referred to later on. Thence to Peter Brown creek, the land is clay, covered with medium sized timber and the same kind of land, with alternations in the shape of some small swamps with clay bottoms, is met with for a further distance of 5 miles to the East. I did not go further, but the engineers of the Transcontinental informed me that, from that point to the Bell river, the land is generally swampy, yet solid enough to be traversed by the line of the railway.

The whole region from lake Askikwaj to within a couple of miles to the north of the line and on both sides of the river Harricanaw as above described forms a remarkably fine tract for cultivation ; the soil being clayey and flat and the difference of level from the river to the head of the Peter Brown creek, a distance of 11 miles, being only 80 feet ; this land is also well drained and considering its situation, traversed as it is by a large river navigable by steamers and by a great line of railway, is certainly destined to have a good future, agriculturally speaking. As regards climate, the two months of June and July during which I was in this Northern region were as warm as in the South of the province, with the exception of a few nights in the beginning of June and the middle of July during which there were white frosts that, I learned on my return, were also experienced at the same periods all over the province.

The ice on the lakes at the head of the Harricanaw had disappeared on the 5th May and I afterwards learned that the summer continued normal to the end of September. Some sowings of potatoes and even of grain made at the depots of the Transcontinental succeeded very well.

I understand that, from the observations taken, there were very low temperatures last winter but, as a rule, it may be said that the climate of that region is comparable to that of the northern part of this province.

The same clayey soil is found to the north of lake Abittibi and I found it especially on the Amitikik river. About 15 miles from the lake, Mr. Moberly, an engineer of the Transcontinental, has had a small piece of ground cleared and has had potatoes, grain and fruit-trees planted in it. At the beginning of July, when I was there, everything seemed to be growing well notwithstanding the drought and I learned afterwards that all had done well. Some attempts at cultivation on a larger scale, at lake Abittibi, have also had good results. That belt of clayey soil seems to continue towards the east with alternating swamps and a little sandy soil. It may, moreover, be said that the whole region east of lake Temiscamingue as far as the height of land, contains extensive areas of good land that are sure to be utilized as soon as means of communication are established.

Timber is fairly abundant but it has already been cut along the Ottawa river and the main waterways. Towards the North it grows smaller and the chief kinds are : black spruce, banksian pine and poplar. The latter is especially abundant and attains dimensions that would allow of its being used for local purposes. There is but little pine and spruce : nevertheless, there is some pine on the north-east side of Long lake beyond the height of land and a little fine grey spruce in the valley of Peter Brown creek.

I have pointed out the few rapids or falls that could be utilized as water-powers, but their capacity is not enormous. Beyond the height of land, in the Harricanaw region, I saw none that could be utilized.

In the rivers and lakes which I navigated, are pike, doré and sturgeon. Pike seem most abundant judging by the Indian fishing stations.

In the season when I travelled I saw but little small game, but I met a great many moose especially about the height of land. There are also red deer there.

Geology

On leaving Ville-Marie, one follows the road running through a fertile region with few rocky out-croppings. At the end of some ten miles, the land becomes more broken and, after passing the Otter river, out-croppings of green rocks of Huronian formation are observed. From Gillies' depot to Long Point, one also finds rocks of eruptive aspect resembling diabase. From that

point to lake Expanse the rock consists of granite and prospecting for mica has been carried on at Bryson's island in that lake. Continuing to ascend the Ottawa river, the land is but slightly broken and the rocky out-croppings consist of granite sometimes turning to pegmatite. On coming to the Kinojevis river, to the north, the rock is gneiss and the same rock is found as far as the entrance to Crooked Lake: continuing on, the rock changes to quartzite and has a Huronian character while, from Long Point to the entrance to Crooked Lake, the rocks met with: gneiss and granite, belong to the Laurentian formation.

The first rapids met (Sturgeon rapids) are avoided by a portage of about three hundred and fifty yards on the left. The rapids are full of boulders and on the portage is a block of pegmatite; a little molybdenite has also been found there. A small rapid follows the first one and the portage to the left is sixty yards long. The current of the river is but slight: the banks are flat or slightly undulating, well timbered and covered with clayey and alluvial soil. There are but few rocks: nevertheless, after passing the Roger river, there are, on either side, hills of granite and pegmatite a couple of hundred feet high. Some miles further on, we leave the Ottawa river, by which one can also go to the height of land, and take its tributary, the Kinojevis river which runs without an obstruction through flat alluvial land without any important tributaries to the discharge of Long lake which is also a canoe route to lake Keewagama. The soil becomes more rocky and one passes between hills of gneiss from 100 to 200 feet high. The gneiss, micaceous at first, then becomes more quartzous and, looking towards the west, one sees a series of similar hills continuing to Crooked lake.

The current of the river is also swifter and at a certain point during low water there is a rapid which does not require, however, to be avoided by a portage. On arriving at the entrance of a deep bay called Crooked lake, gneiss is again observed on both sides. Here passes the winter road used in 1905-1906 to convey provisions for the Transcontinental explorers. So far the rocks met with are clearly Laurentian in character, being granite and gneiss, but now they change and compare with those of the Huronian formation. The river widens under the name of Lake Kinojevis and quartzites are passed on the right; a large island stands across the river whose current becomes stronger on each side; then, continuing on, one comes to a succession of rounded rocks of a green

colour, rather fine-grained with a little quartz and which I have indicated on the map as diorite.

In the vicinity of the southern surveyed line of the Transcontinental, those rocks are well developed and change their character to a slight extent; they are seen in the form of large rounded hills. On the right bank, south of the line, is a hill of that rock with a little quartz and the line itself runs through light green, fine-grained rocks, containing mispickel and in which a little calcite is seen. Continuing, a light-coloured rock is seen containing much white feldspar. About 4 miles north of the line is a schistous diorite while, on the left, is a wooded hill from 200 to 300 feet high which is probably of the same rock.

The river continues to flow quietly without much current with a width of about 150 feet through flat alluvial land covered with timber of various kinds: grey spruce, poplar of large dimensions, banksian pine and a few white pine trees to the Cyclone rapids to which I gave that name in consequence of the visible ravages of a recent cyclone. On both sides of the rapids, which are avoided by a portage on the left of 180 yards, there is a great development of rock especially on the right. Those dioritic rocks, dark green or light green in colour, and having at times a schistous appearance, also present larger grained masses which I have indicated as gabbro. Iron pyrite is fairly abundant in the schists. On the left, I observed a small vein of calcite with iron pyrite and slight stains of galena. The river could easily be dammed at this point and a height of water of some twelve feet with a width of 50 feet be obtained giving a water-power of some hundred horse-power. Not far from there is a small rapid up which canoes can be hauled and which flows over similar rocks.

The west branch of Kinojevis river is passed on the left and the river continues for 7 or 8 miles without much current through clayey soil, well timbered and suitable for cultivation to a small rapid without a portage, followed closely by the Clay rapids, so called on account of the clay found throughout that region. That clay, due to the decomposition of rocks in the vicinity, is very compact and suitable for the manufacture of bricks and pottery. Its origin is clearly shown by the existence of some boulders of strange and rounded shapes, consisting of a greyish green, fine-grained rock. This rapid flows over boulders and is avoided by a portage on the right three quarters of a mile long. After crossing the portage, chloritous schists are observed on the right; then green

diorite that is sometimes schistous, containing some veins of quartz with iron pyrite. On the left the land is low and swampy; there are some plateaux of alluvial soil but it does not seem so good.

About 6 miles from the portage, on the left, is a bare hill of gravel about 150 feet high which seems to continue to the north-east in similar hills, while to the north and north-west rocky hills about 500 feet high are seen. The hill consists of washed gravel on the top while, at a depth of one or two feet, coarse sea sand is found. I washed a couple of panfuls but found only a little black sand.

On the other side of the river is an out-crop of rounded greenish rock, rather fine-grained which I called diabase and which contains small veins of calcite.

The river flows through a flat country as far as the Cascade rapids which are avoided by a portage on the right half a mile long. The rapids flow over large boulders of quartzous diorite. Three miles further on, a slight current is met with. The land is flat but some rocky hills are seen on the right.

Three miles further on, on the right, is a large bare hill, from 200 to 300 feet high, consisting of quartzite through which run numerous veins of quartz of varying thickness, some being as much as 6 feet thick. Pyrite is also observed, but I noticed no other mineral and the specimens I had analyzed yielded nothing. The neighbourhood of that hill is rather swampy but on the other side of the river, to the north-east, are other hills which are probably quartzous also.

The river continues to flow through low and swampy land as far as the Carcajou river. From that on is fine clayey soil without any rocks *in situ*. We leave the north branch of the Kinojevis river and enter, on the south, the Keewagama, which is a fine river 120 feet wide, with hardly any current, running through flat, clayey land, apparently without rocks.

On reaching the first rapids, an out-crop of gneiss of a Laurentian character is noticed in which a little quartz and molybdenite may be seen. The rapids, which are avoided by a portage of sixty yards on the left, flow over the same gneiss; they have a fall of 7 feet over a width of more than 50 feet and would give a good water-power.

From these rapids on, the land is not so good ; it rises on the banks and becomes more rocky, consisting apparently of gneiss. A second rapid, which is avoided by a portage on the left, has a fall of eight feet, and would give a water-power equal to the first one.

We then enter great Lake Keewagama. On the right diorite is seen in the shape of dykes in gneiss. The great peninsula on the right shows quartz and granite on the bank : the interior, which takes the shape of a hill from 200 to 300 feet high, has been prospected and I was shown specimens of quartz obtained there which contained molybdenite. The report of the Geological Survey for 1901 says that specimens brought from there by Mr J. F. E. Johnston, contained bismuth and a little gold. The islands passed while crossing the lake are granitic.

Continuing on to Lake Newagama, gneiss is still found. The land is alternately clayey and a little higher, with some mixed timber in which spruce predominates : then it becomes swampy as far as the height of land over which one passes by a portage, almost flat and two miles long, forming a sort of plateau of clayey soil, fairly well wooded, some large poplars from 10 to 12 inches in diameter being observed. About the middle of the portage is an out-crop of green rock, partly schistous with epidote in fairly abundant quantity. The elevation of the height of land is about 400 feet above Lake Temiscamingue.

After crossing the portage there is a great extent of swampy land through which flows a small winding stream which comes into Lake Askikwaj. The west and northwest shores of the lake consist of rounded masses of diabase, the land in rear consists of light clay very suitable for cultivation and, at the very entrance of the lake, the Indians have planted potatoes which seem to grow very well. The timber was formerly burned and the new growth, from 30 to 40 years old, consists of mixed timber, poplar and banksian pine predominating. Towards the north a long range of mountains is seen which seems to run eastward.

Having crossed the lake in an easterly direction, I saw on the shore on that side rounded rocks, rather soft, and slightly schistous which I called talco-se, through which run veins of calcite. I found no mineral in the latter. At the inlet of the lake, on the right, is a point with a rather considerable out-crop of black crystalline rock the mass of which consists of large crystals of horn-

blende, black mica, biotite and oligoclase feldspar with small veins of calcite containing pyrothite. On the other side of the inlet are chloritic schists. Ascending the inlet one finds similar land with, on a point to the right, some diorite containing a fairly large proportion of magnetic iron.

About five miles from the lake, on the right, is a small out-crop of green serpentine. The river is 100 feet wide: it has but little current and its measured depth is from 15 to 25 feet: the land is flat on both sides and apparently of good quality.

Practically without meeting with any rock a river is reached on the left which is the canoe route to great Lake Victoria and, almost immediately after, Lake Kienawisik, (1) a large sheet of water whose shores consist alternately of clayey soil or light green dioritic rocks, generally quartzous and sometimes schistous. I counted some twenty islands formed of the same rock. On one of them, situate to the south of the largest one on which I was camped, the rock had the aspect of a blue chloritic schist, worn and rounded on the surface by the ice and in which I found a small vein of calcite 5 inches thick.

On leaving this lake the same dioritic rocks are seen on both sides for a distance of about 5 miles to a point where the river widens to 500 and 700 feet with several large bays and then takes the name of Long Lake. The out-crops are black mica gneiss, generally quartzous with, at times, small veins of quartz and of Laurentian character. On the left are hills from 200 to 300 feet high, well wooded and covered with fairly good pine. This is the only region beyond the height of land where I saw merchantable pine. The river has little or no current, its average depth is fifteen feet, the bottom is clay, the banks are low and flat but rise gradually and are covered with mixed timber of good appearance. There are no rocks but rounded boulders of diorite and granite are met with among which I saw an enormous one 25 feet long consisting of dioritic conglomerate.

The river continues thus for about 8 miles, then narrows with deep bays, the character of the country being generally the same. Lake Wiquaskopang

(1) According to a recent survey by Mr A. Blouin, P. L. S., who extended the Rainboth line eastward from the 40th mile, this lake should be $3\frac{1}{2}$ miles further east than is shown on the map accompanying this report.

is then reached whose extremity is about 3 miles north of the height of land. There are some islands of pegmatite and the lake is surrounded by hills of pegmatite showing small crystals of white mica. I examined some points but did not find any mica of commercial dimensions. Nevertheless, I am under the impression that regular prospects would lead to the discovery of some. According to the report of the guardian of the *cache* of the Transcontinental, the ice disappeared on that lake on the 5th May.

From that point, which marks the southern extremity of my exploration, I retraced my steps to Lake Askikwaj which I then crossed from south to north to the entrance, properly so called, of the Harricanaw river. That river is fine and deep, practically with no current and having a width of a quarter of a mile. Its banks, as well as the northern portion of Lake Askikwaj, consist of fine, light, white clay which continues for some twenty miles to the line of the Transcontinental.

At the entrance of the river, on the right, is a mass of syenite which continues for over a mile : then, alternately, clay and rocky out-crops of quartzous diorite and quartzite : 5 miles to the right is a hill of gravel with sandy beaches where I found nothing by washing. A mile lower down on the same side is an out-crop of syenite with veins of quartz and another mile further I examined a rocky islet consisting of granite with veins of quartz containing a little feldspar, mica and molybdenite. Still another mile lower down are out-crops of quartzous gneiss on both sides. The river continues between well wooded banks of clay until dioritic schists are seen on the right before coming to a lake from 2 or 3 miles long and a couple of miles at the most in width. Further on, to the right, are two points of dioritic schists containing cubic pyrite of iron. Continuing on, Peter Brown creek being passed on the right, the first rapid is reached without any rocks being met with. The land generally is low and the upper parts show clay.

Two thirds of a mile above the rapid the line of the Transcontinental crosses the river and the altitude there is 1,000 feet. At that point the river is 400 feet wide and its depth in the middle is 26 feet. The two banks, rising some ten feet, are of clay and the land is then flat on both sides. It is covered with black spruce, a little grey spruce, banksian pine, white birch and large poplar from 10 to 12 inches in diameter at the stump and from 70 to 80 feet high. The soil is first class, being light white clay on the surface with more

compact blueish clay underneath. The guardian of cache No 8, situated there, had planted potatoes and they grew very well.

The first rapid gives a difference of level of only 3 feet and canoes can run down it. It flows over quartzite rocks and has 3 channels. The rock obstructing it could easily be removed by blasting, thereby lowering the level of the river 3 feet and giving additional value to a considerable area of very rich low-lying land which is covered when the waters are high.

Continuing on, the land is flat on both sides and no rocks are seen. Two miles lower down is a small rapid with boulders which can be run in canoes. At its head, on the right, about a hundred and twenty yards from the river, is a bare hill 250 feet high, whose base consists of quartzite and its top is talcose and quartz. I also found loose rocks of graphitic schist. That hill is followed by a series of others running in a northern and north-eastern direction. The river then flows through low land for about 3 miles with a slight out-crop of of schistous diorite on the right where chalcopyrite has been found by prospectors. Two miles further on one passes on the left Red Deer creek, navigable for a distance of a couple of miles and runs a rapid from 300 to 400 feet long, flowing over granitic boulders.

Descending, the river becomes rather wide : from 800 to 1,500 feet without much current, the land being low and wooded on both sides with a single out-crop of quartzous diorite with quartz veins, a mile and a half below the rapid. Further on, the river runs through swampy land to a large lake which my guides called Lake Obalski. On entering it, one sees small elevations of rounded greenish rock which seemed to me to be quartzous diorite. I did not cross that lake, but I estimated that its length was 6 miles and its width from 3 to 4 miles with some islands. This route is but little followed by the Indians, but I have learned since my return that at the end of it is a stretch of 6 miles of smooth water followed by a succession of rapids about 6 miles long. According to my calculations this lake would be about 16 miles from the first rapid.

Throughout that distance, the land varies, but there are good level sections with swamps and rocky hills in rear.

I returned by the same route and then followed the line of the Transcontinental westward to Spirit lake, about 7 miles. The soil consists at first of clay, then of swamps on clay or boulders ; the shores of the lake are sandy. On the

route I found no rocks with the exception of some boulders of quartzous diorite. Returning to the Harricanaw river, I followed the line eastward for about 15 miles : at first the land is flat and clayey, well wooded, as above, for 4 or 5 miles, then there are small swamps on clay or boulders, but only 1 or 2 feet deep.

Seven miles from the river, on the north side of the land, is a rocky hill about 120 feet above the line. That rock consists, at the base, of varied rocks resembling coarse-grained gabbro, then diabase and finally fine-grained green arkose, changing at the summit into a green serpentine containing small threads of asbestos not exceeding a quarter of an inch. I prospected that hill but found no fibre of commercial value. To the north is a deep ravine and beyond it are other small hills that may well be connected with those I mentioned at the second rapid of the Harricanaw river.

Following the line, one comes, a mile further on, to good clay land extending to Peter Brown's creek, about 11 miles from the river and continuing 2 or 3 miles further. I followed the line 4 miles beyond Peter Brown's creek and, at a distance of 3 miles, found small swamps with a clay bottom. I was informed that similar good land existed as far as 5 miles further and that afterwards it became more varied with deeper swamps.

At this part of my journey I met the engineers of the Transcontinental who were locating the final line. At this point the latter is 80 feet above the Harricanaw river and the small shallow swamps with a clay bottom which I have mentioned, could easily be drained and transformed into good farming land.

Peter Brown's creek is not navigable for canoes at the point where the line crosses it : nevertheless there must be plenty of water in it in the spring. The banks are of clay and some twelve feet high. By a portage of a mile and a half, one reaches the point where canoes can get and, with a good current, run down that very winding creek from 30 to 40 feet wide, between banks of clay, to a first rapid which is avoided by a portage. There are also a couple of small rapids which can be run without portaging and, for a distance of from 8 to 10 miles, one follows a pretty, winding river without much current, flowing through flat, clayey and well wooded land, fine gray spruce being seen among the timber. The river seems rather deep and widens to from 50 to 100 feet. Throughout this distance there are no rocks *in situ* and the boulders in the rapids are dio-

rite and quartzite. Then one comes to the Harricanaw river which is about 1200 feet wide at that point.

On the west side of that river and a little lower down I went in a canoe up a small stream for 2 or 3 miles: it winds through low lying clayey land and gives a fair idea of the lie of that section of country and of the advantages to be gained by lowering the level of the river as stated above. The small rapids I have mentioned, both on the main river and on its tributaries, are of no value as water-powers and, if an attempt were made to use them, would be rather a hindrance to the development of that region, essentially a farming country admirably served by the Transcontinental and by the Harricanaw river which, from the height of land to Lake Wiquaskopang, affords navigation for large steamers over a distance of 70 miles as far as the first rapids, to say nothing of its tributaries navigable by small boats for some miles in the interior.

I then ascended the Harricanaw river to lake Askikwaj which I crossed in a south-westerly direction, examining the rocks on that side which consist chiefly of diabase. I took the same route as when I came: after crossing lake Keewagama and following the river of the same name, I ascended the north branch of the Kinojevis river which also takes the name of Nawapitechin. It flows through fine clay land covered with mixed timber: its width is about a hundred feet but narrows to fifty feet higher up. The current is fairly strong and, before reaching No 9 *cache*, there are a couple of rapids which are passed without making a portage. Here and there, some rocks of light green quartzous diorite are seen which are transformed into quartzite as one ascends.

I did not go beyond *cache* No 9 of the Transcontinental but, from information I obtained, I learned that the river is navigable for 15 miles further in summer, that it is winding with many small rapids but that the water-rises very high in the spring and the river could be ascended for 30 miles. This is the route taken to reach Abittibi. The river is said to run through clayey land all the way from its source.

From *cache* No 9 I proceeded to the line of the Transcontinental and to lake Mulsworth. After leaving the clay land there is a long and shallow swamp followed by a sandy belt extending from lake Mulsworth to Spirit Lake where the timber has been burned recently. I found but one out-crop of rock with

veins of quartz and epidote. I came back by the same road and followed in a south-westerly direction the Kinojevis river which, in the middle of July, seemed to have fallen 3 or 4 feet since the spring.

I then ascended the west branch to get to Abittibi. That river is about fifty feet wide ; it flows through clayey land moderately high and covered with mixed timber in which black spruce and large poplar predominate. At first there is a small rapid flowing over boulders which is passed without making a portage, then, after leaving an important tributary on the right, the river becomes very winding, narrows to some 20 feet and is barred by dead trees in many places. The land is clayey and well-wooded on both sides. There are some diorite boulders in which I observed a little hematite and then comes a fall with a short portage on the left ; this fall is only 4 or 5 feet high and is caused by an out-crop of hard, fine-grained greenish gray rock containing mispickel.

A little further on is a rapid flowing over boulders which is avoided by a portage of 180 yards on the right. Then a little chloritic schist is seen and, after passing a swamp, we come to a small lake with many large boulders of granite and syenite. That lake is followed by narrows running through a swamp and then great lake Kajakamikamak is reached. The latter has about 10 islands, its shores are rocky and towards the south-west is a rocky mountain about 500 feet high which has been burned over and which seems to be 1 or 2 miles from the lake. The island on which I camped consisted of fine-grained greenish rock, containing mispickel and similar to that mentioned above. I examined a hill on the east side of the lake which seems to consist of diabase in which some soft portions, resembling chlorite, are observed. The hills around the lake are covered with timber, chiefly poplar, white birch and spruce.

On leaving the lake, the river is fine and about 30 feet wide ; it runs through a swamp and continues thus for a couple of miles to the west, then turns to the north and becomes shallower, winding among alder bushes. When I passed on the 12th July there was hardly any water in that stream and we were obliged to drag our canoe some distance over branches. Then there is dam of dioritic boulders around which we portaged, then a small pond and another dam of rock which we also passed by a portage ; afterwards we come to a longer dam with a regular portage on the right leading to lake Käkameonan. The latter, the last lake on the south side of the height of land, is wooded on both sides and

has swampy shores. On the south-east side of the lake are out-crops of quartzous diorite.

From the extremity of the lake one goes to the height of land by a portage sixteen hundred feet long passing over a hill of clay fifty feet high, well timbered with white birch, poplar and fine grey spruce. A small pond surrounded by hills of quartzous diorite is thus reached.

From that lake one can go to the next by a portage on the right twelve hundred feet long, passing over a rocky hill eighty feet high. On the right of the latter lake is a rather high out-cropping consisting of a fine-grained conglomerate in which quartz and feldspar can be seen. Towards the north-west, the lake narrows and becomes muddy to such an extent that we had to drag our canoe over to a place where the lake widens.

A small, winding and muddy stream flows from the lake. It is greatly obstructed by branches but my guides succeeded in getting the canoe down while I followed the regular portage on the left, twelve hundred feet long, passing over a wooded hill of clay where no rocks are to be seen with the exception of some boulders of quartzous diorite. The stream widens and meanders as far as a small lake three quarters of a mile long at the entrance of which are enormous boulders of pale green quartzous diorite, only slightly worn; the land is flat and timbered on both sides. A navigable stream, winding its way through a swamp, leads to another lake on the right, surrounded by level land, while, on the left, are large hills of green quartzite similar to that observed at La Baie des Pères, Ville-Marie. On leaving that lake one comes almost immediately to great lake Agotavekami.

The shores of that lake are rocky and consist of hills of medium height. It contains many rocky islands. In the eastern part I examined a couple of large hills formed of a greenish conglomerate of quartzite and quartz. I crossed the lake in a north-westerly direction and I examined some islands I passed on the way and found the rock resembling rather large-grained diabase, then another kind finer grained and further on a softer rock with dioritic and chloritic schists. North-west of the lake is a range of high mountains partly bare. The other side of the lake is lower and seems timbered with poplar and white spruce. The lake had fallen three feet since last spring. We then come to the river Abittibi which is shallow at its entrance and about three hundred feet wide, both banks

are undulating and covered with poplar and small spruce : they present a succession of deep bays with some islands ; their width is as much as eight hundred feet. At the entrance are dioritic schists and quartzous diorite while, on the islands, I noticed fine-grained green rock containing the mispickel I have already mentioned. The Danseur rapids, the only ones on this river are three miles from lake Agotavekami. They are in reality small falls seven feet high, falling between two rocky hills, being about one hundred and fifty feet long and one hundred feet wide. The portage is on the right and about two hundred feet away : the rocks are quartzous diorite. These falls could easily be dammed between the two rocky hills and the level of the water be raised from six to seven feet thus giving a difference of level of from twelve to fifteen feet which would supply extensive water-power owing to the great mass of water behind.

After passing the Danseur rapid, the river continues without much current and there are numerous rocky out-croppings on both sides : in the first place a quartzous diorite with quartz grains, then soft green schistous rocks resembling talc and a reddish rock like serpentine, followed by diabase. About four miles from lake Abittibi is a large island which I examined and whose rock, which I call gabro, consists of a green mass with grains of feldspar. Rocky out-croppings continue to be seen on both sides as far as a point whence the lake can be seen : the land becomes flat and sandy and the view extends very far.

At lake Abittibi, on the first point to the east, are the posts of the Hudson's Bay Company and of Revillon Brothers with a group of Indians, amounting in the middle of the summer to four hundred persons. The Hudson's Bay Company have cleared a piece of land and they have potatoes which are growing well, together with a little grain and some hay. They have some cows and oxen. From information given by the officer in charge of the post, the ice leaves the lake about the 10th May and snow begins to lie on the ground from the 15th October. There is a gasoline launch on the lake carrying mails for the Transcontinental survey.

I examined the rocks on the east side of the lake. I was camped near the post of Révillon Brothers and one of my guides noticed on the very rock where we were some bright specks which took for gold. I ascertained that the rock really contained gold in very slight colours, especially in fissures containing a layer of quartz of the thickness of a sheet of paper ; other slight colours seemed also to be in the rock itself. The rock is dark green, fine grained, quartzous

and very hard, similar to that which I have several times already designated in this work under the name of quartzous diorite. It breaks up easily into rectangular blocks owing to the thin sheets of quartz it contains. I found in the neighborhood a small vein of white quartz a couple of inches thick in which I could discover no gold. The analyses that were made of some specimens did not show any either.

Lake Abittibi is shallow ; its depth is said to be eleven feet ; it falls four or five feet in summer.

I followed the eastern shore finding the same rock on the point where the Hudson's Bay Company's post stands ; the rock afterwards becomes more schistous and then there is a fairly considerable strip of white quartzite which I examined without finding anything. Further on, on a slope before reaching Amittikik bay, I found a rather considerable out-cropping of diabase. That bay is shallow and flat ; the rivers run through good clay soil covered with mixed timber. It is about one hundred feet wide and runs without rapids to the line of the Transcontinental, some ten miles.

Some rocky out-croppings are found along it, especially of quartzous diorite. That section of the country seems to be the continuation of the clay belt found near the Harricanaw river and which the line of the Transcontinental crosses almost at a right angle.

At that company's station on that river, Mr F. Moberly, the engineer in charge, has had potatoes, grain and even fruit-trees planted in it. The whole had a fairly good appearance notwithstanding the droughth when I visited the place about the 15th July. The timber consists chiefly of poplar of good dimensions.

I returned to lake Abittibi, ascended the river and got back to lake Agotavekami which I then crossed in a southerly direction. That lake is surrounded by rocky hills and contains a number of islands several of which I examined as I passed. At first I found rather soft green talcose rocks, then boulders of green conglomerate containing grains of feldspar. Then came quartzous diorite and, in the southern part, a light green quartzite, hard and heavy, containing much iron copper pyrites. Then one enters the Kanasuta river, about a hundred feet wide with a slight current. The land is flat and timbered with

poplar and spruce. On the right is a small quantity of green rock with some mispickel.

The river continues to wind through flat country as far as the first rapid where a portage is made to the left over a distance of about one hundred and twenty yards. The rapid runs between two hills of quartzous diorite ; it could be utilized as water-power. The same rocks are met with on both banks for a distance of one or two miles and at that distance, on the left, is a hill of quartzous diorite one hundred and fifty feet high which is crossed from east to west, for a length of about one hundred feet, by a vein of pinkish white calcite containing some grains of chalcopyrite and green stains of carbonate of copper. As one ascends, that vein is mixed with quartz. After passing some rocky hills, the river becomes winding and runs through swampy land. Then we come to a succession of three rapids separated by intervals of a thousand feet of water, as follows : the first, running over quartzous diorite, gives a fall of five or six feet, having a portage of five hundred feet to the right ; the second, running over boulders, has a portage of five hundred feet to the left ; the third, running over boulders, has a portage of three hundred feet to the right.

Shortly after passing those rapids the river runs between a chain of quartzous hills to Lake Obadowagasking.

That lake is full of wooded islands and there is low clay land around it ; the rocks are at first of quartzous diorite which, near the middle of the lake, becomes true quartzite ; towards the southern end of the lake is a kind of dioritic conglomerate with large blocks of flint quartz, then a medium grained rock containing much white and pink feldspar with hornblende which I have designated under the name of syenite on the east side of the lake. At the southern end and on the eastern side is a vein of iron pyrite mixed with quartz. On the other side of the lake stands a large mountain six hundred feet high. By a river winding without a break through a swamp, a small lake three quarters of a mile long is reached which leads to the portage of the height of land. The length of that portage is three quarters of a mile and it passes over a small hill about fifty feet high. I washed some of the gravel but found nothing.

Then one comes to a small lake surrounded by quartzous diorite and afterwards another portage nine hundred feet long, on the right of the discharge, over similar rock, leads to the head of lake Opasatica.

Having heard of the discovery of gold-bearing quartz in that region, I proceeded to the spot where it had been found. To reach it, one has to go by the first deep bay to the east. At the head of that bay I washed some surface débris and found thin colours of gold. A portage of nine hundred feet on the left avoids a rapid and leads to a narrow river by which one reaches lake Ollier. From there a large mountain covered with timber and five hundred feet high can be seen. A short portage over boulders of syenite and quartz leads to a small muddy pond and thence, by a portage of a quarter of a mile on the right, over syenite *in situ*, one reaches lake Renault. A portage of a quarter of a mile over a hill of greenish schist sixty feet high, leads to the shore of lake Fortune where the discovery was made. I found there a rock consisting of a yellowish quartzous mass through which run small quartzous veins from five to six inches wide and over; there are also rusty spots due to the decomposition of iron pyrite.

There are also many large quartz boulders in the neighborhood. The hill I have mentioned consists of chloritic schist and dioritic conglomerate. I saw no gold in the quartz and the samples assayed yielded none, but, by washing the ferruginous débris and also the earth of the hill, especially where the iron pyrite was burned, I obtained thin colours in all the pans. A slight excavation had been made at the foot of the hill on the shore of lake Fortune. In this corner the discoverers, Messrs Ollier and Renault, are said to have found a piece of quartz weighing about ten pounds and showing an abundance of gold in large grains. Those prospectors, having subsequently bought the mine, sent to the Department fine specimens of white quartz showing gold, accompanied by an affidavit establishing the discoveries. I am not in a position to express an opinion as to the value of that region, but at first sight it seems to me that gold might be there in a strip of quartzous conglomerate which would then cover a fairly large area. In any case, two properties have been bought from the Government: one by Mr A. Ollier and others, and the other by the "*King of the North Gold Mines Co. Ltd.*", and prospecting licenses have been taken out by several persons. I also understand that some prospecting work is to be done and we shall have better information at the end of the season of 1907.

While redescending lake Opasatica we saw on the left large hills of very quartzous diorite. On the shores are numerous large and varied boulders among which are conglomerates of various kinds, then on both sides are masses of very quartzous Laurentian gneiss in which are to be seen isolated crystals of quartz and pink feldspar.

There are no islands except in the upper part of lake Opasatica ; the shores are rocky with beaches of boulders : the land generally is undulating and covered with timber consisting chiefly of poplar, white birch and spruce. There are still a few white pine trees but that timber has already been cut for a long time. Continuing down the lake, gneiss, pegmatite and granite are seen.

I turned to the left into the Lonely river which flows in a rather winding course, with a width of about a hundred feet, through low-lying clay land covered with small timber. On arriving at lake Barrière, some granite out-croppings are seen and these are found again on both sides as one descends. After passing the narrows, the lake widens again and takes the name of lake Obikoba : granite is found there also as well as on some islands situate at its southern end. Then there is a rapid which is avoided by a portage on the left between three hundred and three hundred and fifty yards long, leading to a river flowing through a flat country to Lake des Quinze. On the east side of that lake are hills of gneiss and granite while on the left are the clay lands of the township of Guerin.

On the east side, about two miles above the des Quinze rapids, I examined an out-cropping in which a contact of large-grained diabase with gneiss is clearly seen.

After leaving those rapids on the right, still more gneiss is seen but before reaching a spot opposite Long point where the Hudson's Bay Company's post stands, I examined a black rock with large crystals of hornblende which is developed there to a rather considerable extent.

I then followed the shores of the bay and arrived at Gillies' depot whence I had started, having travelled about six hundred miles.

The map accompanying this report, some portions only of which are made out from explorations, is intended to give the most information possible about that region obtained from former maps, from that of the Transcontinental and from my own observations.

As a sequel to this work I give a summary of the explorations made in the same region by the Geological Survey of Ottawa.

Report on lake Temiscamingue, by A. E. Barlow, 1899, Vol. X part 1. Sum-

mary report, 1901, vol. XIV, part A. Eastern part of the Abittibi region, by J. F. E. Johnstone.

Summary report, 1906 : Exploration on the line of the Transcontinental east of lake Abittibi, by W. J. Wilson.

Summary report, 1906 : The Quebec side of lake Temiscamingue, by A. E. Barlow.

During the summer of 1906, Mr W. J. Wilson of the Geological Survey explored the region through which the Transcontinental is to run and extending from lake Abittibi to the Natagan river. His work lay more especially south of that river ; nevertheless, the Harricanaw river was explored to a point twenty-five miles lower down.

The whole geological formation examined seems to be Huronian and but few economic minerals were met with. Molybdenite was found in small quartz veins running through a mass of granite at lake Keewagama and the fact is recalled that in a previous exploration (Summary Report of the Geological Survey, 1901) some specimens, on being analyzed, yielded bismuth and a little gold.

Molybdenite was also found on a small island in lake Askikwaj.

Mr A. E. Barlow, another member of the staff of the Geological Survey, explored the surveyed townships east of lake Temiscamingue. He points out the resemblance of those formations to those on the Ontario side and remarks that the Quebec side generally is covered with a thick layer of earth which renders examination more difficult. He mentions no discoveries of economic minerals.

During the summer of 1906 an exploration was made on the Bell river for a syndicate organized by Mr George W. Mitchell. An extensive territory was prospected and examined by competent experts who discovered, on the Pipestone river, chalcopryite containing a little gold and silver and they considered it probable that important deposits of those minerals lay in the immediate vicinity.

In the same region they also discovered large masses of iron pyrite and likewise twenty miles higher up near lake Shabogama.

The discovery of chalcopyrite on the Harricanaw and at Chibogomo would lead to the supposition that a mineralized belt exists which runs in that direction.

To sum up, the region explored presents a great variety both as regards the richness and uniformity of the soil and the abundance and variety of the timber. With reference to minerals, the region has not yet been sufficiently prospected, but it may be said that a considerable breadth of it is traversed by the Huronian belt running from Chibogomo to Cobalt and that the same rocks are found in it. It should, however, be observed that the mass of the Laurentian formation extends further north than has been hitherto supposed and that only islets of Huronian formation are found in the surveyed townships east of lake Temiscamingue. Much prospecting has been done in that region, but only one company, the "*Jessie Fraser Mining Company*", has purchased a mining concession and put up plant on the south half of lots 7, 8 and 9 of Range VII of Fabre.

Work is being down on indications of chalcopyrite; a couple of shafts have been sunk and some buildings with steam machinery erected. In other parts of those townships have been found galena, chalcopyrite, pyrites containing a little gold, magnetic iron and even a little Cobalt bloom, but so far none of those products have been regularly mined.

In the unsurveyed part may be mentioned, going from west to east, chalcopyrite near Fish Lake on the Ontario boundary; gold-bearing quartz at lake Opasatica and at lake Abittibi; molybdenite has been found in the township of Guerin east of lake Opasatica and also on lake Keewagama and the river of the same name. Chalcopyrite has been found on the Bell river and on the Harricanaw river, north of the Transcontinental. On the Harricanaw river and near the line of the Transcontinental green serpentine has been found which, at one point, showed small threads of asbestos. All these indications, taken in conjunction with the nature of the rock, are sufficient to encourage explorations in that region which will probably lead to important discoveries.

CHIBOGOMO

That district was visited during the summer of 1906 by about 250 persons, including guides, representing some twenty different parties. Prospects seem to have been satisfactory for all the prospecting permits have been renewed and fresh prospects are to be made this year. The Government had also sent a surveying party under Mr S. Lepage, P. L. S., but the work done was of slight importance and a fresh expedition has been organized this winter under Mr John O'Sullivan, P. L. S., who is instructed to lay down the boundaries of several townships in the neighborhood of lake Chibogomo and lake Doré. An order in council has been passed temporarily withdrawing those lots from sale until the Department is in a position to accurately locate the lots whose purchase may be applied for. This will probably be towards the end of the year 1907. Nevertheless, prospecting licenses continue to be granted and they carry the same guarantees as in the past.

According to prospectors' reports, the new developments and discoveries in that district may be summed up as follows : On Portage Island, the Chibogomo Gold and Asbestos Company has sunk a shaft of 35 feet in the eastern part of the large vein of quartz and the bottom shows the continuation of the mineralization in pyrite of copper and an increase in the proportion of gold. Several openings have also been made on this vein which has been found to be a thousand feet wide.

Fresh discoveries of asbestos on the part west of McKenzie bay have also been reported as well as an abundance of magnetic iron north west of the Bay of Islands.

In the peninsula separating lake Doré from lake Chibogomo, chalcopyrite has also been found by Mr H. A. C. Machin who sank small shafts from six to eight feet deep and made some cuttings. He reports having found ores containing copper, gold and silver in sufficient quantities to justify further work being done. An abundant spring of mineral water is also said to have been found in

that section. Similar prospects were made on the north side of lake Doré, showing copper, gold and silver with magnetic iron also.

In the part west of lake Doré, Mr John Kokko found pyrrhotite containing a good proportion of copper and a large proportion of gold. I observed visible gold in the specimens shown me.

Copper pyrite has also been found on the Rapid river.

The most important discovery of the season consists in that of pink arseniate of cobalt (cobalt bloom) found on the Chibogomo river about ten miles below lake Assinibastats. The rock in which it has been found is light green in colour, compact and like the schistous diabase found in the Cobalt region. The prospectors who showed me those samples assured me that it was found in fair abundance but, as they were not familiar with those ores and as it was late in the season, they did not make any further prospects. I was told that *bloom* had also been seen at a couple of other points.

The similarity of the Chibogomo formations to those of Cobalt has already been mentioned by Messrs Low and Hardman who visited that region in 1905 and they drew the conclusion that the same minerals might possibly be found there.

The winter road has been put in order and it is reported that provisions were conveyed to lake Chigobiche, a distance of about sixty-five miles, in loads of nine hundred pounds per horse. It is also reported that from that point to lake Chibogomo the road is in good condition and that heavier loads can be transported there.

Several parties of prospectors and the Government surveyers have taken advantage of the road this winter and conveyed provisions there. It is expected that a good many will visit the district this summer but no real work can be done until a railway runs there and, beyond rumors, we have no knowledge of anything having been done in that direction.

Mr A. P. Low's, geological report on the Chibogomo mining region has been published in pamphlet form with a map.

Mr F. G. Pauli who visited Chibogomo in 1906 has published a nice pam-

phlet with photographic views and maps in which he gives an interesting description of his journey. He mentions an important spring of mineral water whose medicinal properties he vaunts to the north-east of the peninsula separating lake Doré from lake Chibogomo near the falls forming the discharge of the latter.

Mining Operations

IRON

The blast furnaces of Radnor and Drummondville were in operation during the year with the following results.

Ore charged	18,331 tons of 2,000 lbs worth	\$61,175.00
Limestone charged . .	2,710 “ “ “	1,485.00
Charcoal	995,880 bushels of 20 lbs “	74,573.00
(The weight of the bushel being taken to be 20 lbs.)		
Pig iron produced . . .	7,851 tons of 2,000 lbs, worth	\$177,643.00

The ore consists of bog ore from various parts of the Province.

No work of any importance was done in any of the other iron mines of the Province but experiments are being continued in connection with the concentration and fusion of the magnetic sands of the North Shore.

With reference to the treatment of those sands, I would observe that they are very abundant in New Zealand and the Government of that colony, with a view of developing that industry, offers to purchase 65,000 tons of iron manufactured from that sand at the price on the English market, adding the cost of freight and giving also a bonus of one pound sterling 1 per ton for the first 20,000 tons. The “Moore, Heskett” process of direct treatment for iron and steel has been tried and an experimental furnace erected at South Melbourne, Australia. The ore is dried, separated magnetically and conveyed to a heating chamber using the waste heat from the other operations. Thence it goes to another chamber where the reduction is effected in the presence of a jet of reducing gas and afterwards it is taken to the fusing chamber.

I also call attention to the Grondal process for concentrating and agglomerating iron ores which seems to have been successfully applied at Herrang in Norway and which is claimed to be well adapted for the utilization of magnetic sands.

TITANIC IRON

Many applications for information have been received at the Bureau of Mines in connection with our deposits of titanic iron with the view of utilizing it as iron ore or as a source of titanium, but no work has yet been done on those deposits.

OCHRE

The Canada Paint Company and the Champlain Oxide Company have continued to get out and to calcine ochre at St. Malo, near Three Rivers. The production was 1,962 tons worth \$19,620.00.

CHROME IRON

This industry continues to develop in Colrairie and this year two companies produced the crude and the concentrated ore.

The Black Lake Chrome and Asbestos Company worked throughout the year with eighty-five men between Black lake and lake Caribou with very satisfactory results. The most important operations were in the vicinity of shaft No. 1 at the foot of the hill where the sinking of a new shaft was begun. Electric power for the mines and concentrating works is furnished by the river St. Francis Company. The Black Lake Chrome and Asbestos Company has further obtained the control of the properties of the Montreal Chrome Iron Company consisting of lots 25 and 26 of range II and 26 of range III of Colrairie.

The Canadian Chrome Company (Limited) which works on lot 16 of range A of Colrairie, has completed the installation of concentrating works consisting of twenty stamp-mills and 5 Wilfley tables. The lack of water has prevented the company from extending its works but it is now making preparations for the purpose of utilizing the water of a lake a mile and a half distant from the mine. The ore is shipped *via* Thetford.

The American Chrome Company produced nothing this year but did some prospecting on its property.

The greater portion of the ore produced in Colrairie was shipped to the United States. A few hundred tons were sent to Buckingham to be treated

for ferrochrome. 110 men were employed for periods varying from 4 to 10 months. The total production may be summed up as follows, in tons of 2,000 lbs. :

1st class in rock	417 tons worth	\$ 4,743.00
2nd " "	4054 " "	34,375.00
Concentrate "	4490 " "	52,716.00
Total		8961 \$91,834.00

The first class contains about 50 per cent of sesquioxide of chrome, the second class about 45 per cent and the concentrate from 49 to 54 per cent. Prices were low, the 50 per cent ore being worth \$13.00 at the mine and the 45 per cent, \$9.00.

COPPER

Notwithstanding the high price of copper, which is now 25 cents a pound, the copper of the Eastern Townships mines has assumed no development. The only ones really in operation are the Eustis and Nichols mines at Capelton, while some work was done at the Ascott, Suffield and King mines.

The production was 32,527 tons of 2,000 lbs, whereof 24,642 tons were shipped to the United States and the remainder was treated at Capelton for sulphuric acid and matte by the Nichols Chemical Company which produced 374 tons of matte, containing 53 per cent of copper.

In the neighborhood of Sherbrooke, I visited some prospecting works showing rather satisfactory indications which will no doubt be developed this year.

Some prospecting was also done at the old Acton mine which it is proposed to re-open if the results are good.

In the northern region of the Province, rather important indications of copper have been found. I have pointed them out in my special exploration reports but they may be summarized as follows :

At lake Chibogomo and lake Doré are important deposits of chalc pyrite

which is also found on the Bell river and the Harricanaw river. There are indications of chalcopyrite in Pontiac, near the Ontario boundary.

In the township of Fabre, the *Jessie Fraser Copper Mining Company (Limited)*, of Niagara Falls, Ont., purchased last year the south half of lots 7, 8 and 9 of range VII of Fabre, county of Pontiac, with the view of working a deposit of copper ore. I visited that mine in June 1906. The work done then consisted of some surface prospects and of a shaft about twenty feet deep. A quartzous vein is seen in it containing chalcopyrite with a little magnetic iron. I also found small stains of native copper. The analyses made by the company show that this ore contains a little gold and silver. The land had already been prospected about fifteen years ago and found to contain industrial minerals.

At the time of my visit some ten men were employed : houses were being built and steam machinery put up. The company has continued to work, using machinery. The shaft has been sunk to 60 feet and some hundred feet of drifts have been made, showing two workable veins. They are about to put in a second steam boiler which, with the first, will give fifty-five horse-power, and also compressed air plant for two drills. There has been no production this year. The mine is 2 miles from Ville-Marie and is accessible by good roads.

LEAD, ZINC AND SILVER

Owing to the rise in the price of metals, many old mines have been re-opened and prospected with the view of installing new plant and of developing them, but there has been no production this year.

The Wright galena mine, at lake Temiscamingue, seems to have changed hands and the only work done with a dozen men consisted in repairing the plant and putting the shaft in good order.

The blende and galena mines of Calumet Island, formerly worked by the Grand Calumet Mining Company, were prospected under option by a new organization which did some prospecting with about 15 men on the Lawn, Russell and Bowie properties, obtaining very good results. A few tons of samples were got out and shipped for tests and the probabilities are that work of some importance will be done in 1907. I refer to my report for 1898, for information regarding those mines which have not been worked since. The indi-

cations at that time were very satisfactory and certainly justify further work in connection with them.

Something was done about the galena mines formerly opened on the north shore of Gaspé Bay but we have received no information on the subject.

GOLD

Practically no gold was produced in the Province this year, but there has been some activity in that direction and it is possible that we shall see some progress in that industry in the near future.

At Chibogomo, gold, either in quartz or in connection with copper ores, has been mentioned in previous reports and last season other discoveries were made north of lake Doré. On Portage Island, the Chibogomo Gold and Asbestos Mining Company prospected the large vein of quartz 40 feet wide, for a length of 1,000 feet, making cross-cuttings and sinking a shaft 35 feet. Gold was found evenly distributed and, as the vein descends, it becomes more mineralized with chalcopyrite and also shows a higher proportion of gold and silver.

North of lake Doré, a prospector found a vein of pyrrhotite rich in copper, several feet thick, in the sides of which gold is visible in fair abundance, while samples of ore when assayed yielded as much as an ounce of gold to the ton.

In the region north of Pontiac, during my exploration there, one of my guides found gold on the point occupied by the post of the Revillon Brothers Company on lake Abittibi and I ascertained the existence of gold, but in small quantities, in the rock *in situ*.

Near the height of land, at the head and east of lake Opasatica, prospectors found a sample of very remarkable quartz, weighing several pounds and showing coarse grains of gold. Some work was done which justified the purchase of two blocks of mining lands from the Government and fine samples of quartz, showing gold, were produced with the applications. The samples were accompanied by affidavits showing that they had been discovered there. The discovery was made by Messrs Alphonse Ollier and Auguste Renaud who purchased a block. A second block was bought by Mr D. M. Morin who transferred it to the *King of the North Gold Mines Company* which proposes to develop that property by putting up machinery.

I visited the discovery in July last and ascertained the presence of quartz in fair abundance in well defined form in a greenish gray rock of schistous structure and rather hard. I did not see any gold but in all the debris I washed in the pan and in the burned pyrites, I found fine colours of gold. The region around those properties is under prospecting licenses issued to a certain number of persons and prospecting will be carried on this summer. It is situate about fifty miles from Klock's farm on Lac des Quinze and is easily reached in three days by canoe. There is only one small portage of a quarter of a mile at the foot of lake Obikoba. These discoveries are about fifteen miles in a north-easterly direction from Larder lake (Ontario) where a gold-bearing district was discovered last autumn.

In another region, the Eastern Townships, some activity has been displayed, especially in the townships of Ascot and Marston. In Ascot, some forty years ago, the work I mentioned in my report on gold (1898) had been begun, by the Goleonda Gold Mining Company on lots 1, 2 and 3 of range XIII of Ascot. The work was abandoned for some reason unknown to us and the company did not even retain the ownership of the land.

Last year Mr C. E. Kennedy, of Beebe Plain who had already done some work in the alluvial gravel of Felton brook in that region with which he had become familiar, undertook to prospect on the above mentioned lots. He found a little alluvial gold but at the same time he observed in the schists constituting the bed-rock, numerous veins or lentilles of quartz in which gold could be seen. Laboratory assays seemed to show that it was present in workable quantities. I visited that district in the month of September last and assured myself that gold could be seen in the quartz. In the valley of the creek, on the east side, is an out-crop of schists standing almost vertically and seeming rather disturbed in which I found, within a distance of a quarter of a mile, four masses of quartz several feet thick seeming to run in a general north-easterly direction. I saw colours of gold in that quartz and by crushing and washing some in a pan I collected many colours, some being of the size of a millet seed. It seemed to me that there was also a little gold in the schist. Those quartz veins are ill-defined and, as already stated, are mixed among the schists in the shape of lentilles. The alluvial gold found in that region seems of local origin and to be due to the decomposition of those rocks; thus, their study would be interesting and would justify further working. A company, called the *Eagle Mining Company*

of Rock Island, P. Q., has been organized for the purpose and numerous licenses have been taken for other lots in the vicinity.

In the township of Marston, county of Compton, near lake Megantic, quartz showing gold was discovered in the autumn, but no work could be done during the winter. Licenses have been taken out and prospecting will doubtless be carried on in the spring.

Work was done in Beauce by the *Beauceville Gold Mining Company*, on the Gilbert river. A shaft 24 feet deep was sunk near the line between lots 74 and 75 of range I, north-east. Eighteen inches of black soil were met with, then two feet of clay, and the remainder consisted of gravel and large boulders in which fine colours are found which become larger near the bed-rock. A great deal of water comes into the shaft. Another shaft twelve feet deep on lot 74, six hundred yards from the Chaudière River, showed gravel with fine gold.

The same company also began this winter to sink a shaft on lot 15 of de Léry, a few hundred feet from the works of the North Star Company. The production of gold has been practically nil.

Some work was also done by Mr A. Morrison in St. George. He sank a shaft 125 feet deep, a mile to the south of the church of St. George, on lot 128 of the cadastre of that parish. He found 120 feet of boulder clay and five feet of clay before striking the bed-rock.

Some prospecting was done and a little gravel washed on the Famine and on the du Loup rivers.

In Ditton and in Emberton some individuals prospected and found indications of varying importance.

From the above it will be seen that little of importance has been realized; nevertheless, from the recent discoveries made, we may hope to see the Province of Quebec become a producer of gold in a few years.

ASBESTOS

The production of asbestos has again increased this year and prices have continued high. Practically, all the mines have been in operation and new companies have been formed. At Thetford, the King, Bell, Johnston and Beaver

mines have been in regular operation with an increased out-put. An important fact to be noted is that the Shawinigan Water Power Company has run a cable to Thetford and, in 1907, will supply electric power under good conditions. All the companies that have not already done so will alter their plant accordingly.

Another noteworthy feature is the underground work undertaken by the Bell Company. Hitherto, with few exceptions, asbestos has been extracted by means of open quarries. That company, whose property is bounded by the King and Johnstone mines and whose lots on the other side are covered by buildings and by the railway line, has begun at the bottom of its quarry, 200 feet deep and 120 feet below the line of the Quebec Central Railway, a tunnel running under that line and in the direction of the mill; from that tunnel, drifts have been run transversally. The ground so traversed contains an abundance of asbestos of good dimensions which can then be taken out. At Black lake, the American Company has acquired the properties of the Glasgow and Montreal Asbestos Company and of the Manhattan Asbestos Company and those mines will be used to supply the American Company's mill. The latter company has also established at Nashua, N. H., near Boston, a factory for making asbestos boards with a capacity of 10,000 feet board measure *per diem*.

This asbestos board industry which has been discussed for several years, seems about to materialize and, in addition to the aforesaid factory, another is to be established in the Province of Ontario.

The Standard Asbestos Company has transferred a portion of its territory on the north-east to a new company called the *Dominion Asbestos Company, Limited*, which is to begin operations at once and put up an extensive mill.

The Union mine was not worked this year; neither was Dr Read's mine on which a little work was done last year by the Syracuse Asbestos Company and which will now be worked by the *Megantic Asbestos Company*.

At East Broughton, the Broughton Asbestos Company has rebuilt and enlarged its plant under the name of the *Broughton Asbestos Fibre Company*; the Quebec Asbestos Company has made some additions to its plant. The latter companies worked through out the year with good results

In the same region prospecting was done on adjoining properties; good indications of asbestos were found and it is intended to organize new companies

for the purpose of working them. One has already been organized under the name of the *Eastern Townships Asbestos Company* and has begun to put up a mill

At Colraine Station, a new company, the *Colraine Asbestos and Exploration Company, Limited*, has also been organized to re-open the old Lambly mine. Some forty men were employed during a portion of the season in prospecting and developing the mine and in building a mill which was finished in November.

Another company is being formed, under the name of *Premier Mining Company*, to develop the adjoining property.

In Wolfestown, the *Asbestos Mining and Manufacturing Company* has finished putting up a mill on the old Peters' property. The asbestos from this mine will be shipped *via* Colraine Station.

At Danville, the Asbestos and Asbestic Company continues its work with the same activity. During the year, four new cable derrieks and new machines have been put in to utilize the electric power to be supplied by the Shawinigan Water-Power Company.

The prospects, begun last year in Tingwick by Mr R. H. Martin, were continued this year. I visited them in October. Two quarries had then been opened and the surface had been cleared showing fairly good serpentine with small asbestos fibres. Steam machinery had been put up and a small experimental mill with a cyclone erected. The shipping point will be Danville, about ten miles distant. About twenty men were employed then.

At the mouth of the Rivière des Plantes in the first range of the seigniory of Rigaud-Vaudreuil, the *Beauverille Asbestos Company* resumed the work it had begun two years before on an out-crop of serpentine, showing fair asbestos, which follows the valley of the Rivière des Plantes. Prospects of some importance were carried on and the company proposes to develop them this year.

No work was done in connection with the Laurentian asbestos in the Ottawa region.

According to the companies' reports, the total production of asbestos for 1906 was as follows, in tons of 2,000 lbs :

1st class crude.....	1,477 tons....	worth \$324,380 00
2nd " "	2,450 "	worth 321,355.00
Fibre.....	18,542 "	worth 815,962.00
Paper stock.....	39,906 "	worth 681,956 00
<hr/>		
Total.....	61,675	\$2,143,653.00
Asbestic.....	21,119 tons....	worth 18,875.00
<hr/>		
Total.....	82,794 tons....	" \$2,162,528.00

Two thousand men, receiving \$750,000 in wages were employed for periods of from eight to twelve months. All the Asbestos got out is sold at once. This industry is thus very flourishing and the increased production was about 25 per cent more than last year.

The production, exclusive of asbestic, for the previous years was as follows :

1904.....	35,479 tons	worth \$1,186,795.00
1905.....	48,960 " "	1,475,450.00
1906.....	61,675 " "	2,143,653.00

AMBER MICA

The amber mica industry has been very flourishing this year ; prices, especially for small mica, have been remunerative and the demand is growing ; consequently the production this year is greater than last year. Nevertheless, with the exception of the Blackburn Bros Company, there have been no large producers and all the mica obtained comes from small companies. There is also a tendency to use a good portion of the product in the shape of split mica. There are several establishments in Ottawa and Hull which prepare it in that form. The Laurentides Mica Company has workshops at Ottawa, Aylmer, Hull and Buckingham where it prepares as split mica the thumb-trimmed mica coming from Ontario and from our Province. The same company has also begun to manufacture, at Ottawa, plates of micanite made by putting together sheets of *split mica* which are glued to one another, subjected to strong pressure which

reduces their thickness to about $1/16$ of an inch. The sheets are cut to the dimensions required or in the shape demanded by the needs of the industry.

About 800 women and girls are thus employed in preparing mica in that region.

The Blackburn Bros Company worked the Perkins Mills' mine regularly and also for some months on lot 17 in the Gore of Templeton from which a fair quantity of mica was got out. The company also bought a little mica from small producers and all that mica was prepared in the company's shops in Ottawa.

At the main mine they use electric power supplied by a fall about 2 miles from the mine which drives a 75 horse-power motor and an air compressor with 7 drills. They also intend to put in a motor for hoisting purposes. At the falls there is a triphase 115 K. W. generator of 2,300 volts.

The company has also installed new workshops for preparing mica in Ottawa where it employs from 50 to 60 women or girls.

As stated above, there are many small producers and some mining licenses were granted this year in the county of Ottawa to mine for mica which is afterwards sold to the larger shops in Ottawa. It is rather difficult to give the exact figure of the production of the mica or of its value, for a portion of the mica is sold *rough-culled*, another *trimmed* and still another *split*. Nevertheless, the figures given below, taken from the producers' reports, give a fairly accurate idea of that industry. We show a rather considerable amount under the head of *rough-culled*, but it should be observed that some of this mica was sold to companies that prepare it in the Province of Ontario and that the price fixed is the one given by the producers, being an average of \$150.00 per ton. It may be said that some of this mica yields 75 per cent of merchantable mica, 50 per cent being under and 25 per cent above 2 3.

We therefore give the production of amber mica for 1906 as follows :

1 2.....	106,478 lbs. worth	\$ 13,327.00
1 3.....	112,896 "	20,755.00
2 3.....	75,968 "	30,048 00
2 4.....	65,565 "	36,232.00
3 5.....	25,956 "	18,061.00
4 6.....	9,512 "	8,891.00
5 8.....	923 "	760.00
<hr/>		
Total.	397,298 "	\$128,074.00
Split mica...	72,788 "	22,973.00
To this must be added 87 tons of rough-culled mica and which we estimate as having yielded about 60,000 lbs. of merchantable mica		
		17,840.00
		<hr/>
		\$168,887.00

256 work-people were employed in that industry, including about a hundred women or girls, in the Province of Quebec. Work on the ground was done during periods of from three to twelve months while work in the shops was carried on throughout the year. The sum of \$61,579 was paid out in wages to those work-people.

WHITE MICA AND RARE EARTHS

The only mines of white mica worked this year were those of Maisonneuve, in the county of Berthier and of Pieds des Monts, behind Murray Bay. Those two mines are owned by the *Canadian General Mining Company, Limited*. At Maisonneuve, the company has put up steam machinery and several buildings. Moreover it is preparing to utilize the water-power supplied by a rapid about two miles distant on the Rivière du Milieu. Surface prospects have been made and the sinking of a shaft begun with steam drills. A little white mica was found as well as the minerals that usually accompany such veins of pegmatite, the most interesting being samarskite and fergusonite which are found in fairly important quantities in the rock in small masses varying from a few grains to one pound and even more. If those minerals possess the value attributed to them, it might be possible, by extraction, to obtain a sufficient quantity for treatment. A sample of samarskite was submitted to Professor H. E. Barnes,

of McGill University, who recognized its strong radio-activity and that it contains 0.04 grammes to 0.05 of radium per ton, being about 25 per cent of that contained in the pitchblende of Joachimstahl which contains 0.17 grammes.

The Maisonneuve mine is about fifty miles from the St. Felix de Valois, station on the Canadian Pacific Railway.

A sample of samarskite from Maisonneuve, analyzed by Mr Milton L. Hersay, yielded oxyde of Tantalum (Ta 2.05) — 5.60 per cent, corresponding to 4.60 of tantalum; oxyde of thorium (Th .02) — 3.24 per cent, corresponding to 2.85 per cent of thorium.

The Pieds des Monts mine was prospected to a slight extent and some houses were put up for the workmen. This mine is 18 miles from Murray Bay.

The company worked during the greater part of the year at its installation, employing some forty men and it now proposes to develop these mines. Samples have been sent to Europe and some tons of mica, coming partly from the old workings have also been shipped.

TALC

Hitherto, notwithstanding numerous applications for information on the subject, the talc of this Province has been but little utilized and one company only worked on a small scale, some years ago, on a deposit of compact talc in Wolfestown. In view of the possibility of a development of this industry, I give below some notes on this mineral.

Talc is in reality a silicate of hydrated magnesia whose colour varies between blueish gray and white, the latter colour being the most sought for: nevertheless, in the state of powder, it is usually white. In this Province, it is found in connection with belts of serpentine in the Eastern Townships where it is called soapstone and steatite. It is used for the following purposes: in the massive state for lining the inside of hearths, for slate-pencils, for tailors' chalk, for gas jets and in the electrical industry: in the state of powder, as a lubricant, as a toilet powder, for painting and a number of minor uses. The most important variety of talc, however, is that with a fibrous or schistous texture. The former, called Rensselaerite, is worked on a large scale at Gouverneur, in the State of New-York, whence 71,100 tons, worth \$615,350.00, were shipped in

1902 to be used especially in the manufacture of paper. We have, in the Eastern Townships, a schistous variety of this product of a light olive green colour and I pointed it out long ago as being suitable for the same purpose.

There is an important deposit on cadastral lots 681, 683, 684 and 685 of Craig's Road range in the township of Ireland, county of Megantic, on which work has been done by a company now in process of organization to be called *The Megantic Tale Company*. It is represented by Mr C. V. M Temple and others of Toronto. Prospects have been made to the depth of some feet on this property and the indications are considered satisfactory. Some tons were got out, but nothing was shipped. The shipping point will be Black Lake Station on the Quebec Central Railway, nine miles distant, with good roads between. The company intends to put up machinery for pulverizing the product on the spot and it may then be used in Canada or exported. In 1905, 687 tons worth \$7,676.00 were imported into Canada.

PHOSPHATE

Mr J.-F. Higginson, the manager of the Capelton Chemical and Fertilizer Company, whose works are in Buckingham, informs us that about 575 tons of phosphate, worth \$4,025.00 were utilized by his company. Most of this came from the Blackburn Brothers' mine and the remainder from small producteurs.

GRAPHITE

The manufacture of graphite made but little progress during the year although many persons prospected and mined the various deposits of graphite. In the township of Joly, county of Ottawa, a local organization, called *The Iroquois Graphite Syndicate*, of Labelle, did some prospecting in connection with a recent discovery of graphite. They report that they made excavations from 5 to 12 feet deep and found veins of pure graphite of from 1 to 6 inches. The work is being continued.

At Ottawa, the *Calumet Mining and Milling Graphite Company* developed the mine situate on lots 16 of ranges II and III of Grenville, county of Argenteuil, and got out a fairly large quantity of ore. The company is putting up a mill for the purpose of treating that product. Some thirty men were employed for five months.

At Buckingham, the Buckingham Graphite Company worked during a portion of the year and shipped some graphite to the United States. The company worked on lot 19c of range VIII of Buckingham and transformed the mill of the old Walker Company.

The *Diamond Graphite Company* worked with some twenty men on lot 14 of range X of Buckingham and got out some hundreds of tons of ore. A mill is to be built on that property.

Other works were carried on in the neighborhood of Buckingham, but we have no information beyond the fact that they were in connection with a mine called *Belle Mine*, three miles east of Buckingham. Work preparatory to mining was done and a shaft forty feet deep was sunk for the mine on lots 15, 16 and 17 of range IV of Amherst, Ottawa county. As may be seen, a good many men, about eighty in all, were employed in this industry during the year.

A certain quantity of ore was got out and will no doubt be treated during the coming season, but the reports only show shipments of 125 tons, worth \$8,300.00.

COMBUSTIBLE NATURAL GAS

The *Canadian Gas and Oil Company* seems to have carried on a regular business with the natural Gas of the St. Lawrence valley, especially in the Louiseville region. The company reports having bored into the rock to depths of from 180 to 250 feet, and having obtained gas under strong pressure which is then conveyed by lines of pipes to the neighboring villages. The company has a dozen producing wells and has laid a line of two inch pipes two miles long to St. Barnabé, one of three inch pipes, seven miles and a half in length, to Yamachiche and one of four inch pipes, nine and a half miles long, to Louiseville. It is also about to lay a line of eight inch pipes, thirteen miles long, which will reach Three-Rivers about the middle of the summer. The company claims that it can at present sell 300,000 cubic feet of gas a day and the prices charged at Three Rivers will be 20 cents per 1,000 cubic feet for public buildings, 25 cents for factories and 30 cents for private individuals. The company likewise proposes to increase their production by means of fresh borings.

Prospecting for natural gas was tried in the vicinity of St. Hyacinthe but we are not aware of the results.

MISCELLANEOUS

No feldspar or baryta was produced this year and we are not aware of anything of importance having been done in connection with molybdenite. Neither have we anything to point out with reference to peat.

PORTLAND CEMENT

Two companies manufactured Portland cement in the Province : the International Portland Cement Company, at Hull, and Mr J. M. Morgan, at Longue Pointe near Montreal. The latter has transferred his property to the Fordwick Company, 5 Nassau Street, New-York. The two companies follow the dry process and use the Trenton limestone and the clay they find on the spot where their works are situated. The prepared cement is used exclusively in Canada. The production for the year was 405,103 barrels, worth \$625,570. Three hundred workmen were employed during the year, their wages being \$136,000.

BUILDING MATERIALS

There is nothing special to note in connection with those materials. Slates paving stones and granites were quarried as in the previous year and the same remark applies to building stone, bricks and limestone. As it is very difficult to follow these industries closely, owing to their being carried on by a large number of small producers, we have taken the following figures from the census for 1901 :

GRANITE

Quarries.....	12
Workmen.....	658
Wages paid.....	\$238,761
Granite shipped.....	51,873 cubic yards
Value of granite.....	\$560,236

LIME-STONE

Quarries.....	26
Workmen.....	515
Wages paid.....	\$155,882
Lime-stone shipped.....	97,710 cubic yards
Value.....	\$223,580
Rubble stone shipped..	35,850 tons
Value.....	\$15,000

CLAY

Quarries	90
Workmen	1,462
Wages paid	\$300,062
Common bricks	90 millions
Value	\$493,000
Vitrified bricks	$\frac{1}{2}$ million
Value	\$11,000
Pressed brick	3 $\frac{1}{2}$ millions
Value	\$21,000
Tiles and pottery, value	\$ 270,000

LIME

Number of kilns	53
Workmen	124
Wages paid	\$43,500
Quantity sold (bushels)	556,000
Value	\$96,000

*Summary statement of the yield of the mines in the
Province of Quebec, for the year 1906*

KIND OF MINERALS (Tons of 2,000 lbs.)	Wages paid	Number of workmen	Quantities shipped or used	Gross value
Bog iron ore.....	22000	120	18331	61175
Chromic iron.....	37200	110	8961	91834
Copper ore.....	95000	250	32527	176681
Asbestos.....	747600	1950	61675	2143653
Asbestic.....			21119	18875
Mica (pounds).....			530086	168887
Calcined ochre.....	12000	56	1962	19620
Phosphate.....			575	4025
Graphite.....	23800	83	125	8300
Slate (squares).....	16000	50	5469	24446
F ag-stones (yards).....	1700	6	2400	2050
Cement (barrels).....	136000	300	405103	625570
Granite (cubic yards).....	238761	653	51873	560236
Lime (bushels).....	33500	124	556000	96000
Bricks.....	300000	1462	94000000	525000
Tiles and pottery.....				270000
Lime stone (cubic yards).....	155882	515	97710	223580
Totals.....	1829443	5679		5019932

To sum up for the year 1906. the total value of the mineral products got out and shipped was \$5,019,932.00, the value being calculated at the mines in the raw state or after undergoing a first classification to make the product merchantable. Thus asbestos is counted partly in the state of fibre; chrome, partly as concentrated; mica, partly *thumb-trimmed* or split; ochre, calcined. With regard to building materials, clay or lime-stone can hardly be considered as merchantable products, but cement, lime, bricks, tiles, etc, are.

As each province has a different method of calculating the value of mining products. the totals cannot be taken as a basis of comparison, but merely the separate figures for each article.

It should further be observed that some of those products are manufactured in the Province and their manufacture practically adds to the value of our mining and metallurgical industry. Thus iron ore is made into pig iron at Radnor and at Drummondville; a portion of the chromic iron is treated at Buckingham for ferro-chrome; a portion of the copper ore is treated at Capelton for sulphuric acid and for matte; all the phosphate is transformed into superphosphate at Buckingham.

Neither have we included in the above total combustible gas which is beginning to acquire a certain value, nor mineral water.

Workmen to the number of 5680 were employed for periods varying from five to twelve months and the wages paid them amount to \$1,829,443.00.

According to the reports received, 7 men were killed during the year and 5 were seriously wounded.

During the year, 7,851 tons of charcoal pig iron, worth \$177,643.00 and 374 tons of copper matte worth \$6,000 were produced.

LEGISLATION

Important changes have been made in the Mining Law with the view of facilitating its application, but without altering the principle.

On the 7th February 1907 an order-in-council was passed classifying all minerals, except building materials, as superior metals. The price of mining lots was changed as follows: superior metals, \$10.00 per acre when more than 20 miles from a railway and \$20 dollars when under that distance; inferior

metals, \$2.00 and \$4.00 respectively. The fee for mining licenses was raised to \$10.00. An amendment to the Mining Law was submitted to the Legislature and came into force on the 23rd March. It fixes the maximum area of land to be granted under a prospecting license to the same person, within a radius of 100 miles, at 25 square miles or 30 lots of 100 acres. Not more than 400 acres of mining lands can be sold to any one person in the same year within a radius of 100 miles. Miners or owners of inferior metals under mining patents have the first right to the purchase of superior metals.

A fee of \$10.00 is exacted for registration of all transfers of mining rights.

NOTICE TO PROSPECTORS

Every application for a prospecting or for a mining license must be accompanied by the required fee and give an accurate designation or description of the land. The application must be addressed to the Honourable Minister of Mines. Reports must be sent in on the expiration of licenses.

*List of Mining Companies in the Province of Quebec
in operation or in position to work,
with their addresses*

MAGNETIC SAND

Quebec Iron Ore Co., (The) 75 St. Peter street, Quebec.
H. C. Bossé, 112 St-Peter street, Quebec.
W. Robertson, 233 St. James street, Montreal.

CHARCOAL PIG IRON

Canada Iron Furnace Co., (The) Canada Life Bldg., Montreal.
John McDougall & Co., 597 William street, Montreal.

TITANIC IRON

G. Gagnon, 87 Artillery street, Quebec.

OCHRE

Canada Paint Co., Ltd., 572 William street, Montreal.
Champlain Oxyde Co., (The) (Lucien Carrignan), Three-Rivers.
Thomas Argall, Three-Rivers.

CHROMIC IRON

Black Lake Chrome & Asbestos Co., (The) Black Lake.
American Chrome Co. (The), Black Lake.
Star Chrome Co., (The) Colrairie.
Canadien Chrome Co., (The) St-Hyacinthe.
King Bros' Co., (The) Thetford Mines.

COPPER

Eustis Mining Co., (The) Eustis.
Nichol's Chemical Co., Ltd., (The) Capelton

J. McCaw, Sherbrooke.
G. E. Smith, Sherbrooke.
A. O. Norton, 280 Congress street, Boston Mass., E. U.
Dr A. F. Foss, Lennoxville.

LEAD

British Canadian Lead Co., Ltd., (The) Lake Temiscaming.
N. McCuaig, Bryson.

GOLD

King of the North Mining Co., (The) Montreal.
Gilbert River Gold Fields Co., Ltd., (The) St. François.
C.-A. Parsons, South Dudswell.
Louis Mathieu & Cie, Beauceville.
Louis Gendreau, Jersey Mills.
C.-E. Kennedy, Beebe Plain.

GRAPHITE

Diamond Graphite Co., (The) Buckingham.
Buckingham Graphite Co., (The) Buckingham.
Calumet Mining and Milling Graphite Co., (The) Calumet.

MANGANESE

Magdalen Islands Co., 92 St. Peter street, Quebec.

ASBESTOS

Bell Asbestos Co., Ltd., (The) Thetford Mines.
King Bros.' Mine, Thetford Mines
Johnson Asbestos Co., (The) Thetford Mines.
Beaver Asbestos Co., (The) Thetford Mines.
American Asbestos Co., Ltd., (The) Black Lake.
Standard Asbestos Co., Ltd., (The) Black Lake.
Dominion Asbestos Co., Ltd., (The) Black Lake.
Union Asbestos Mine, Black Lake.
James Reed, Beedsdale
Broughton Asbestos Fibre Co., Ltd., (The) East Broughton.

Megantic Asbestos Co., Black Lake.
Quebec Asbestos Co., (The) East Broughton.
Asbestos Mining and Manufacturing Co., (The) Chrysotile.
Asbestos and Asbestic Co., Ltd., (The) Danville.
R.-H. Martin, New-York, U. S.
Colrairie Asbestos and Exploration Co., Ltd., (The) Colrairie Station.
Premier Mining Co., (The) Colrairie Station.
Beauceville Asbestos Co., (The) Beauceville.
Ottawa Asbestos Mining Co., 514 Sussex street, Ottawa.

MICA

Wallingford Mica and Mining Co., (The) 41 Duke street, Ottawa.
Blackburn Bros., 46 Sussex street, Ottawa.
Wellingford Bros., Ltd., 24 Central Chambers, Ottawa.
Fortin & Gravelle, Hull.
General Electric Co., (The) Isabelle street, Ottawa.
Laurentides Mica Co. Ltd., (The) corner Bridge and Queen, Ottawa.
Vavassour Mining Association, (The), E.-F. Nellis, 22 Metcalfe street,
Ottawa.
Comet Mica Co., (The) 398 Wellington Street, Ottawa.
Lila Mining Co., (The) D. L. McLean, 5 Sparks Street, Ottawa.
Allan Gold Reefs Co., Ltd., (The) Victoria Chambers, Ottawa.
Webster & Co., 274 Stewart street, Ottawa.
Thomas J. Watters, Metropolitan Building, Ottawa.
Brown Bros, Cantley.
Lewis MacLaurin, East Templeton.
Richard Moore, Pickanock.
Joshua Ellard, Pickanock.
Glen Almond Mica & Mining Co., (The) Buckingham.
Kent Bros, Kingston, Ont.
Henry F. Flynn, Maniwaki.
Chabot & Cie., Ottawa.
Gatineau Valley Mica Co., (The) Hull.

PURCHASERS OF MICA

Laurentides Mica Co., Ltd., (The) Bridge & Queen streets, Ottawa.
Eugène Munsell & Cie., 332 Wellington street, Ottawa.

General Electric Co., Isabelle street, Ottawa.
Webster & Co., 274 Stewart street, Ottawa.
F. D. Moore, 354 Wellington street, Ottawa.

TALC

C. V. M. Temple, 175 Spadina Road, Toronto, Ont.

PHOSPHATE

J. F. Higginson, Buckingham.

FELDSPAR

W. A. Allan, Victoria Chambers, Ottawa, Ont.

COMBUSTIBLE NATURAL GAS

Canadian Gas & Oil Co., Louiseville, Co. Maskinongé.

SULPHATE OF BARYTA

Canada Paint Co., (The) 572 William street, Montreal.

PEAT

Imperial Light, Heat & Power Co. Ltd., (The) Liverpool, London & Globe Building, Montreal.

SLATE

Rockland State Quarry, New Rockland.

FLAG STONES

F. R. Bishop, Bishop's Crossing, Co. Wolfe.

CEMENT

Thomas M. Morgan, Longue Pointe.
International Portland Cement Co, Ltd., (The) Hull.

GRANITE

Stanstead Granite Quarries Co., Ltd., Beebe Plain, Co. Stanstead.
S.-B. Norton, Beebe Plain.
James Brodie, Graniteville, Co. Stanstead.
The Whitton Granite Quarry Co., St-Victor de Tring
M. Fitzgerald, Sainte-Cécile, Co. Compton.
Jean Voyer & fils, Rivière à Pierre, Co. Portneuf.
Joseph Perron, Rivière à Pierre.
M. P. Davis, 48 Central Chambers, Ottawa.
J. Brunet (Laurentian Granite Quarry), Côte des Neiges, Montréal.
J.-A. Nadeau, Iberville.

BRICKS.—(The principal companies)

Thos. W. Peel & Co., Montreal.
J. Brunet & Cie., Montreal
Chs. Sheppard & Son, Montreal.
Joseph Bernier, Montreal.
Joseph Descarries, Montreal.
Laprairie Brick Co., Laprairie.
Narcisse Blais, Quebec.
Frs. Grenon, Quebec.
Paradis & Létourneau, Quebec.
Laliberté et Fils, Saint-Jean Deschaillons, Co. Lotbinière.
Victor Charland, Saint-Jean Deschaillons.
D.-G. Loomis & Son, Sherbrooke.
Eastern Townships Brick and Manufacturing Co., Sherbrooke.

LIME. (The principal companies)

Dominion Lime Co., Sherbrooke.
Cyrille Gervais, Montreal
Olivier Limoges, Montreal.
Montreal Lime Co., Montreal.

**Companies using certain products of the mines to be manufactured
in this province**

The Electric Reduction Co. Ltd., Buckingham (ferrochrome and phosphorus)
The Chemical and Fertiliser Co., Buckingham (Superphosphate)
Mica Boiler Covering Co. Ltd., 92 Ann street, Montreal
Electro Manganese Reduction Co., Shawenegan
Standard Chemical Co., Coaticook (Acetate of lime)
Standard Drain Pipe Co. Ltd., St. Jean d'Iberville
C. E. Dubord, Beauport, (Refractory clay)
Geo. Bélanger, Beauport. (Refractory clay)
The Montreal Terra Cotta Co. Ltd., Maisonneuve

To the foregoing list should be added a list of the companies recently organized to operate the mines of our Province or merely for prospecting purposes and which, although they do not produce as yet, are at least partly destined to play an important part in the development of our mineral industries

The Chibogomo Gold and Asbestos Co., Ltd., 131 St. James street, Montreal,

The King of the North Mining Co. Ltd., Montreal.

The Eagle Mining Co., Rock Island, P. Q.

The Jessie Fraser Copper Mining Co., Niagara Falls, Ont.

The Dominion Prospecting and Mining Co., Montreal.

The Tilbury and Temiscaming Silver Mining and Development Co., Ville-Marie, P. Q.

The Manhattan Cobalt Mining Co. of Quebec, New-York, U. S. A.

The Inter-Provincial Mining Co., Toronto.

The above companies have been incorporated or registered under the laws of the Province of Quebec during the year, but other companies or syndicates are being organized and we give below the names of some that have come to our knowledge :

The Cobalt Silver Nugget Co. Ltd., Ville-Marie, is prospecting in Fabre.

The Raven Lake Gold and Copper Mining Co. Ltd., Hull, is prospecting in Pontiac.

The Iroquois Graphite Syndicate, Labelle, is prospecting in Joly.

The Northern Quebec Mining and Development Syndicate, Quebec, is prospecting at Chibogomo.

The North Cobalt Mining Co., Ville-Marie, is prospecting in Fabre.

The Inter-Provincial Mining Co., Ltd, Toronto, is prospecting in Pontiac.

The Great Northern Gold Fields Co., Montreal, is prospecting in Pontiac and at Chibogomo.

MILTON-L. HERSEY, M. Sc., GOVERNMENT ASSAY LABORATORY

171, St. James Street, Montreal, Que.

Telephone (long distance) Main 252.

FEEES FOR ASSAYS AND ANALYSES

	4 samples or less at one time each	More than 4 at one time each.
Gold.....	\$1.00.....	\$0.90
Silver.....	1.00.....	0.90
Gold and silver.....	1 00.....	0.90
Copper.....	1.00.....	0.90
Lead....	1.25.....	1.15
Zinc.....	1.50.....	1.35
Nickel.....	2 00.....	1.80
Arsenic.....	2.00.....	1.80
Manganese.....	2.00.....	1.80
Chromium.....	2.00.....	1.80
Antimony.....	2.00.....	1.80
Bismuth.....	2.00.....	1.80
Silica.....	1.00.....	0 90
Iron (metallic).....	1.00.....	0.90
Phosphorus.....	2.00.....	1 80
Titanium.....	1.50.....	1.35
Sulphur.....	1.50.....	1.35
Alumina.....	1.50.....	1.35
Ferric oxide.....	1.00.....	0 90
Lime.....	1.50.....	1 35
Magnesia.....	1.50.....	1.35
Graphite.....	1.50.....	1.35
Moisture.....	0.25.....	0.25
Combined Water.....	0.50.....	0.50
Insoluble Matter.....	0.50.....	0.50

IDENTIFICATION OF MINERALS

The laboratory is prepared to issue a report on samples, giving description

as far as may be determined by rough qualitative tests, with the probable metallic contents or commercial value of the sample. A nominal fee of 25 c. is charged for each sample.

Determination of radio-activity of a mineral.....	\$1.00
Ascertaining the presence of radium.....	3.00



Harricanaw River



Harricanaw River



Harricanaw River. Lake Obalski



White Fish River Moberly's Camp



Harricanaw River, below first Rapid



Lake Abittibi. H. B. Post and Mission



Peter Brown River



"Cache" No. 8 of Transcontinental RR., near 1st rapid
of Harricanaw River



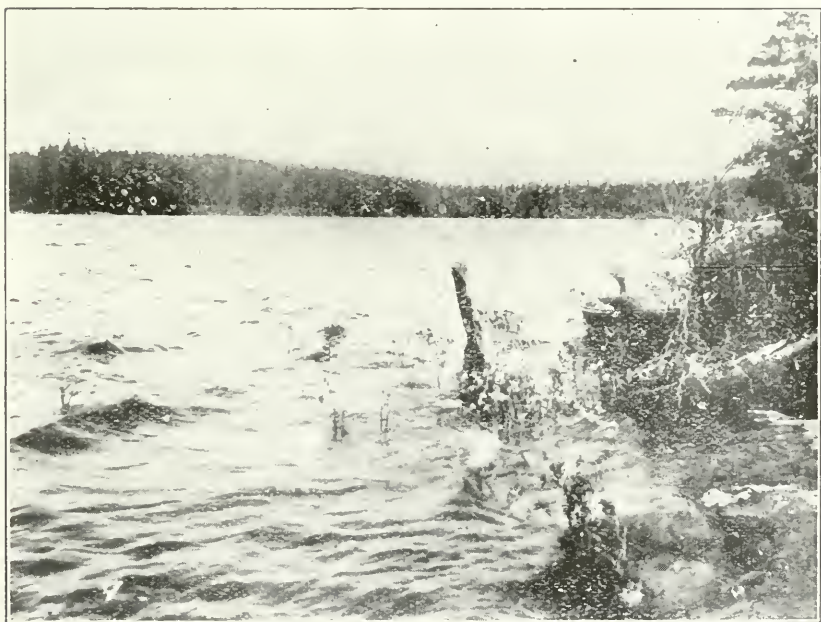
Harricanaw River (below the Lake Askikwaj)



Lake Askikwaj



"Cache" No. 9 of Transcontinental RR. Newapitechin River



Des Quinze Bay



Rapid of Lake Obikoba



Height of lands, East of Lake Newagama

Table of Contents

	PAGE
Exploration in Pontiac.....	5
Distriet of Chibogomo.....	28
Iron.....	31
Ochre.....	32
Chrome.....	32
Copper.....	33
Lead, zinc and silver.....	34
Gold.....	35
Asbestos.....	37
Amber mica.....	40
White mica and rare earths.....	42
Talcum.....	43
Phosphate.....	44
Graphite.....	44
Natural combustible gas.....	45
Miscellaneous.....	46
Portland Cement.....	46
Building materials.....	46
Statistics.....	48
Legislation.....	49
List and addresses of Companies, etc.....	51
Montreal laboratory.....	58



